

MITSUBISHI LASER DIODES

# ML7xx16 SERIES

2.5Gbps InGaAsP DFB LASER DIODE

TYPE  
NAME

**ML725B16F/ML720J16S/ML725J16F**

## DESCRIPTION

ML7xx16 series are uncooled DFB (Distributed Feedback) laser diodes for 2.5Gbps transmission emitting light beam at 1310nm.  $\lambda/4$  shifted grating structure is employed to obtain excellent SMSR performance under 2.5Gbps modulation. Furthermore, ML7xx16 can operate in the wide temperature range from -20°C to 85°C without any temperature control.

## FEATURES

- $\lambda/4$  phase shifted grating structure
- Wide temperature range operation (-20°C to 85°C)
- High side-mode-suppression-ratio (typical 45dB)
- High resonance frequency (typical 11GHz)

## APPLICATION

2.5Gbps transmission

## ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter             | Conditions | Ratings   | Unit |
|--------|-----------------------|------------|-----------|------|
| Po     | Output power          | CW         | 6         | mW   |
| IF     | Laser forward current | -          | 200       | mA   |
| VRL    | Laser reverse voltage | -          | 2         | V    |
| IRD    | PD forward current    | -          | 2         | mA   |
| VRD    | PD reverse voltage    | -          | 20        | V    |
| Tc     | Operation temperature | -          | -20 ~+85  | °C   |
| Tstg   | Storage temperature   | -          | -40 ~+100 | °C   |

## ELECTRICAL/OPTICAL CHARACTERISTICS (Tc=25°C)

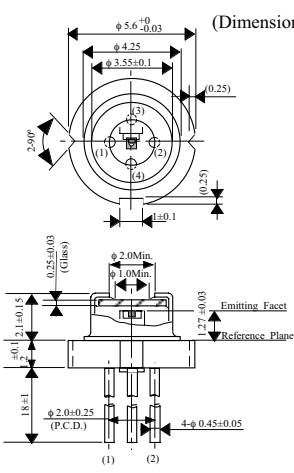
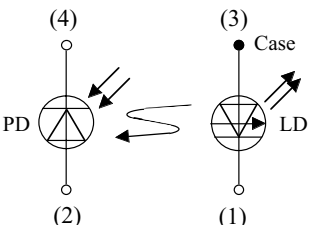
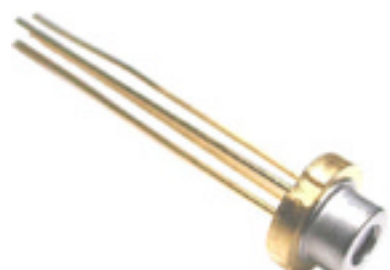
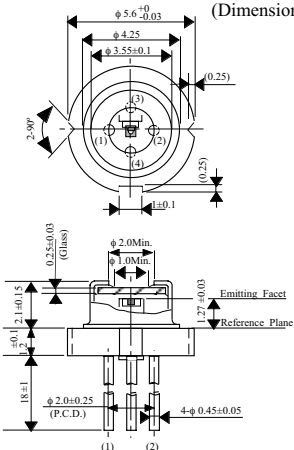
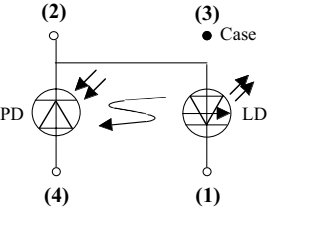
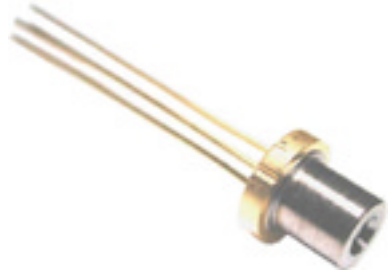
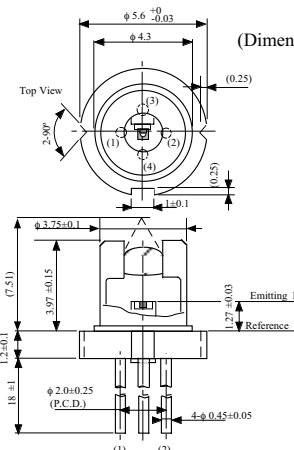
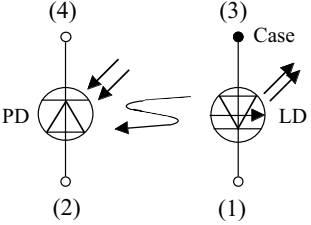
| Symbol           | Parameter                        | Conditions                                                                                       | Limits |      |      | Unit  |
|------------------|----------------------------------|--------------------------------------------------------------------------------------------------|--------|------|------|-------|
|                  |                                  |                                                                                                  | Min.   | Typ. | Max. |       |
| Ith              | Threshold current                | CW                                                                                               | -      | 10   | 15   | mA    |
|                  |                                  | CW, Tc=85°C                                                                                      | -      | 35   | 50   | mA    |
| Iop              | Operation current                | CW, Po=5mW                                                                                       | -      | 30   | 40   | mA    |
|                  |                                  | CW, Po=5mW, Tc=85°C                                                                              | -      | 75   | 100  | mA    |
| Vop              | Operating voltage                | CW, Po=5mW                                                                                       | -      | 1.1  | 1.8  | V     |
| $\eta$           | Slope efficiency                 | CW, Po=5mW                                                                                       | 0.18   | 0.25 | -    | mW/mA |
| $\lambda_p$      | Peak wavelength                  | CW, Po=5mW, Tc=-20°C~+85°C                                                                       | 1290   | 1310 | 1330 | nm    |
| SMSR             | Side mode suppression ratio      | CW, Po=5mW, Tc=-20°C~+85°C                                                                       | 35     | 45   | -    | dB    |
| $\theta_{//}$    | Beam divergence angle (parallel) | CW, Po=5mW                                                                                       | -      | 25   | 40   | deg.  |
| $\theta_{\perp}$ | (perpendicular)                  | CW, Po=5mW                                                                                       | -      | 30   | 47   | deg.  |
| fr               | Resonance frequency              | 2.48832Gbps, I <sub>bias</sub> =I <sub>th</sub> , I <sub>pp</sub> =40mA                          | -      | 11   | -    | GHz   |
| tr,tf            | Rise and fall time(10%-90%)      | 2.48832Gbps, I <sub>bias</sub> =I <sub>th</sub> , I <sub>pp</sub> =40mA<br>not including package | -      | 100  | 150  | psec  |
| Im               | Monitoring current (PD)          | CW, Po=5mW, VRD=1V                                                                               | 0.1    | -    | 2.0  | mA    |
| Id               | Dark current (PD)                | VRD=5V                                                                                           | -      | -    | 0.1  | μA    |
| Ct               | Capacitance (PD)                 | VRD=5V, f=1MHz                                                                                   | -      | 10   | 20   | pF    |



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## OUTLINE DRAWINGS

|                                                                                                             |                                                                                                           |                                                                                                        |
|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <p><b>ML725B16F</b></p>    | <p>(Dimension:mm)</p>    |  <p>ML725B16F</p>   |
| <p><b>ML720J16S</b></p>  | <p>(Dimension:mm)</p>   |  <p>ML720J16S</p> |
| <p><b>ML725J16F</b></p>  | <p>(Dimension:mm)</p>  |  <p>ML725J16F</p> |

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TYPICAL CHARACTERISTICS

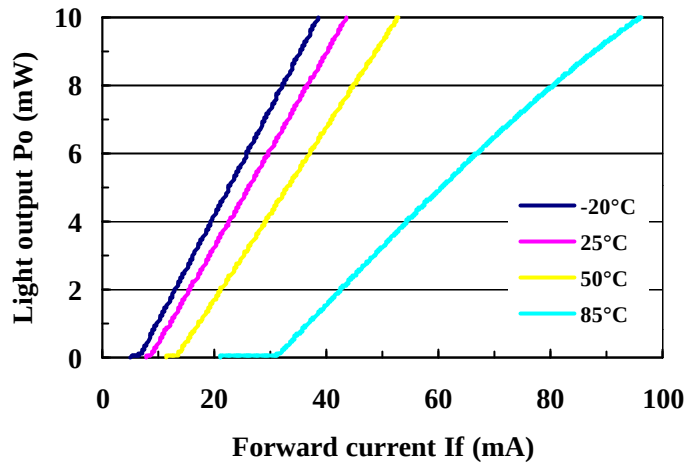


Fig. 1 Light output v.s. forward current

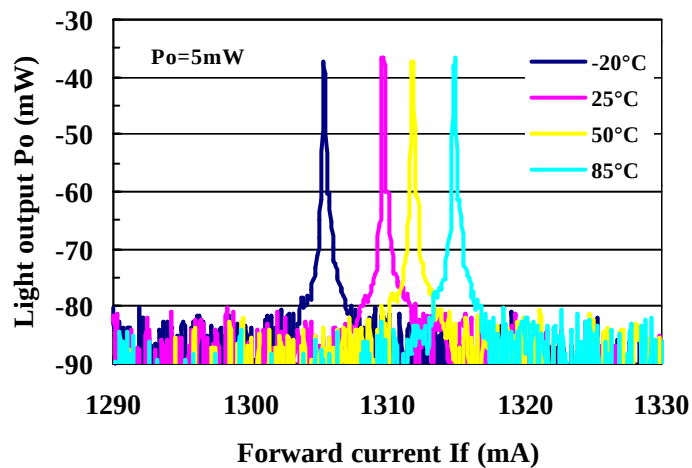


Fig. 2 Spectrum

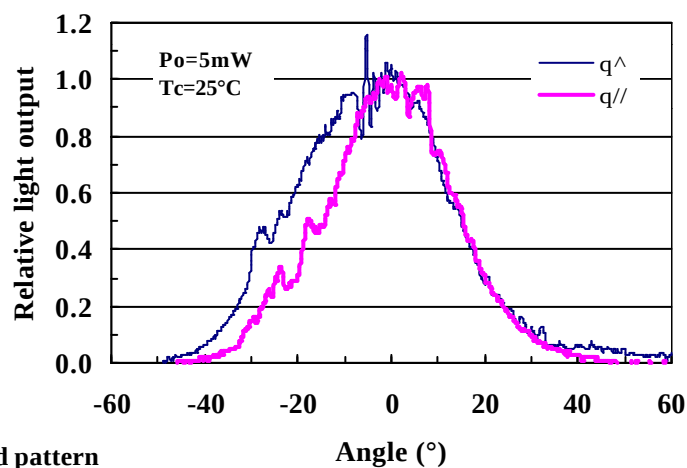


Fig. 3 Far field pattern